DOCUMENT RESUME

ED 427 133 UD 032 780

AUTHOR St. Clair, Sibyl Y.
TITLE Evaluation of the ACHIP Pilot Project, Detroit Public Schools, 1997-1998.
INSTITUTION Detroit Public Schools, MI. Office of Research, Evaluation, and Assessment.
PUB DATE 1999-01-00
NOTE 62p.
PUB TYPE Numerical/Quantitative Data (110) -- Reports - Research (143) -- Tests/Questionnaires (160)
EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS Academic Achievement; *Achievement Gains; Achievement Tests; *Computer Assisted Instruction; Elementary Education; *Elementary School Students; Elementary School Teachers; Formative Evaluation; Pilot Projects; Program Evaluation; Standardized Tests; *Teacher Attitudes
IDENTIFIERS *Detroit Public Schools MI

ABSTRACT

The Achip Pilot Project was implemented in six Detroit (Michigan) public schools during the 1997-98 school year. The Achip is a small hand-held device with a computer chip that allows students to access information about their subject matter. Teachers can develop this information by creating exercises that are in alignment with their lesson plans to reinforce concepts that have been taught. Trained students at Detroit's career and technical center school can then reprogram these exercises on the Achip computer chip. A summative evaluation of the program examined the achievement gains on the Michigan Educational Assessment Program for 655 students, and a formative evaluation explored 16 teachers' opinions of the program. For grades 4 and 7, students in the Achip program demonstrated achievement test gains comparable to the school as a whole. Still, classroom teachers evaluated the program positively. Based on findings from the summative evaluation, it is recommended that ad hoc committees evaluate any future agreements with the Achip Company (unit supplier). Issues to be considered include teacher inservice training and alignment of the pre-programmed software to the district's core curriculum objectives. Recommendations are made for program improvements. Three appendixes contain the Achip Company's list of pre-programmed modules, the company's description of Achip's features and benefits, the teacher survey, and information on survey responses. (Contains 20 tables and 15 figures.) (SLD)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED 427 133

EVALUATION OF

THE ACHIP PILOT PROJECT

DETROIT PUBLIC SCHOOLS
1997-1998

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
☒ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

J Moore
DPS

Sibyl Y. St. Clair, Evaluator

OFFICE OF RESEARCH, EVALUATION AND ASSESSMENT
DETROIT PUBLIC SCHOOLS
January, 1999

BEST COPY AVAILABLE

UD034780

TABLE OF CONTENTS

Program Facts..... i

Executive Summary..... ii

Program Description..... 1

Methodology..... 2

Findings..... 3

Conclusions and Recommendations..... 29

Appendices

A. Achip Company's List of Pre-Programmed Computer Modules..... 31

B. Achip Company's Claims of Achip Unit's Features and Benefits..... 33

C. Achip Pilot Project Teacher Survey, Bar Graphs of Teacher Responses to Survey Item Groups, and Summary Report of Teacher Responses to Survey Question..... 35

Program Facts

Name of Programs:	Achip Pilot Project
Funding Year:	1997-98
Purpose (s) of Program:	1) To reinforce concepts after the material has been taught. 2) To expose the Achip unit to teachers, students, and parents. 3) To establish a service bureau in which students are responsible for creating programmable data chips to be inserted into the Achip unit.
Features of Program:	The Achip unit is a small, hand-held device with a computer chip, which allows students to access information about their subject matter. Teachers can develop this information by creating exercises that are in alignment with their lesson plans to reinforce concepts that have been taught. Trained students at Breithaupt Career and Technical Center's service bureau then reprogram these exercises on the Achip computer chip.
Funding Source:	Achip Company
Funding Level:	Provided by Achip Company
Number of Student Participants:	655
Number and Level of Schools in Program:	6 participating sites: 1 high school, 1 career technical center, 2 middle schools, and 2 elementary schools
Names of Schools:	Breithaupt Career Technical Center, Farwell Middle School, Finney High School, Golightly Educational Center, Hanneman Elementary School, Webber Middle School
Staffing Pattern:	22 teachers
Instructional Time:	Varies
Equipment Materials:	840 Achip units (140 units per participating school)
First Year Funded:	1997

Evaluation of the Achip Pilot Project
Executive Summary

Program Description

The Achip Pilot Project was implemented in six Detroit Public Schools during the 1997-1998 school year. These schools are: Breithaupt Career and Technical Center, Farwell Middle School, Finney High School, Golightly Educational Center, Hanneman Elementary School, and Webber Middle School.

The purposes of the Achip Pilot Project were (a) to reinforce concepts after the material has been taught, (b) to expose the Achip unit to teachers, students, and parents, and (c) to establish a service bureau in which students are responsible for creating programmable data chips to be inserted into the Achip unit.

Methodology

The summative evaluation of this study was designed to address two objectives: (a) students participating in the Achip Pilot Project will demonstrate achievement levels on the 1998 Michigan Educational Assessment Program's Test (MEAP) that are higher or comparable to the school results, and (b) students participating in the Achip Pilot Project will demonstrate gains in normal curve equivalent (NCE) units on the Metropolitan Achievement Test (MAT 7) from 1997 to 1998 that exceed those of a control group.

A total of 655 identification numbers of students who participated in the Achip Pilot Project were obtained. The 1998 MEAP scores and the MAT 7 scores from 1997 and 1998 were obtained for students who participated in the Achip Pilot Project. Frequency distributions were then prepared depicting: (a) the percent of Achip participants demonstrating satisfactory, moderate, and low achievement levels on the MEAP mathematics and reading, and (b) the NCE gains of the Achip participants and the control group on the MAT 7 total mathematics, total reading, and science from 1997 to 1998.

An analysis was conducted based on these frequency distributions which: (a) compared the MEAP results of the students who participated in the Achip Pilot Project to the school results, and (b) revealed the number and percent of students from the treatment and control groups achieving a gain of at least three NCE units on the MAT 7, as well as the number and percent achieving a gain greater than zero, but less than three NCE units.

The formative evaluation was designed to ascertain whether the classroom teachers of the schools using the Achip unit would evaluate the program positively. Participating teachers of the Achip Pilot Project were asked to respond to a survey developed by the Office of Research, Evaluation, and Assessment with input from the Achip Program Manager. The survey questions were grouped according to the following categories:

1) Content of Achip software
2) Presentation of Achip software
3) Support
4) Assessment

5) Management
6) Student Response
7) Achip reprogramming procedures
8) Amount of usage in/out of classrooms
9) Use of Achip in various subject areas

Sixteen of the total 22 teachers who participated in the Achip Pilot Project responded to this survey (72.7%).

Findings

On the Grade 4 MEAP reading and mathematics tests, the students who participated in the Achip Pilot Project demonstrated achievement levels that are comparable to the school results in the satisfactory, moderate, and low categories.

On the Grade 7 MEAP reading and mathematics tests, the students who participated in the Achip Pilot Project demonstrated achievement levels that are comparable to the school results in the satisfactory, moderate, and low categories.

The students who participated in the Achip Pilot Project did not demonstrate NCE gains on the MAT 7 that exceed those of a control group. On the mathematics and reading sections of the MAT 7, it was verified that no significant differences exist between the students participating in the Achip Pilot Project and the control group. On the science section of the MAT 7, it was found that a significant difference exists between the two groups; the students participating in the Achip Pilot Project lost more NCE units (12.79) than the control group (5.03) on average. Also, students participating in the Achip Pilot Project lost NCE units on the MAT 7 total mathematics (3.85), total reading (3.11), and science (12.79) sections from 1997 to 1998.

Based on the findings from the formative evaluation, classroom teachers of the schools using the Achip unit evaluated the program positively. In each of the nine categories in which the survey questions were grouped, it was found that the average response of the classroom teachers ranged from 2.09 to 2.93 on a scale of zero to three, with three being the most favorable.

Conclusions and Recommendations

Based on the findings from the summative evaluation regarding the MEAP and MAT 7 tests, it is recommended that ad hoc committees evaluate any future agreements with the Achip Company. This committee would include principals, curriculum specialists, curriculum supervisors, technology consultants, and members of the research and evaluation team. Issues to be considered by this committee include (a) teacher inservice training, and (b) alignment of Achip pre-programmed software to the district's core curriculum objectives.

Based on the findings from the formative evaluation, the following recommendations have been made for Achip developers:

1. Work together with participating teachers in an effort to improve the integration of the Achip unit during classroom instruction, rather than after the material has been taught.

2. Improve the capacity of the Achip unit to address the needs of limited English-proficient students by adjusting the Achip unit and its software appropriately.

3. Review on-screen instructions in an effort to improve the unit's capacity to make instructions consistent and easy to use.

4. Improve the incorporation of various presentation methods in the Achip unit to appeal to students with various learning styles.

5. Work with participating teachers in order to improve a variety of learning ideas on Achip software that is used for extended, enrichment, and remedial activities.

6. Review pre-programmed modules in an effort to improve applications to real life situations.

7. Work with participating teachers in order to include an increased variety of assessment capabilities of the unit.

8. Improve the unit's capability to maintain a given student's performance record on a particular exercise or quiz after that student exits the exercise or quiz.

9. Improve teacher and student control of appropriate aspects of the software.

10. Improve the unit's capability to allow students to exit software and resume at a later time.

11. Improve the unit's capacity to yield measurable student learning by adjusting how the unit reports to students about their progress.

With regard to the Achip Pilot Project's reprogramming procedures, the process needs to be easier, more accurate and timely. Also, it is recommended that Detroit Public Schools' curriculum specialists and supervisors review the Achip pre-programmed modules to test their alignment with the district's core curriculum objectives.

A committee composed of Achip Pilot Project teachers, technology consultants, curriculum specialists, and curriculum supervisors is recommended to set a level of student participation in the Achip Pilot Project as well as identify subject areas in which the Achip unit would best be utilized.

Evaluation of the Achip Pilot Project

Program Description

This is an evaluative report of the Achip Pilot Project that was implemented in six Detroit Public Schools during the 1997-1998 school year. These schools are: Breithaupt Career and Technical Center, Farwell Middle School, Finney High School, Golightly Eductional Center, Hannenman Elementary School, and Webber Middle School.

The purposes of the Achip Pilot Project were: (a) to reinforce concepts after the material has been taught, (b) to expose the Achip unit to teachers, students, and parents, and (c) to establish a service bureau in which students are responsible for creating programmable data chips to be inserted into the Achip unit.

The Achip unit is a small, hand-held device with a computer chip, which allows students to access information about their subject matter. Teachers can develop this information by creating exercises that are in alignment with their lesson plans to reinforce concepts that have been taught. Teachers use a specially designed form to record the exercises or quizzes that they want programmed. Trained students at Breithaupt Career and Technical Center's service bureau then reprogram these exercises on the Achip computer chip. The service bureau is responsible for creating programmable data chips to be inserted into the Achip unit. An Achip Company representative transported the programmable; teacher developed exercises to and from Breithaupt's service bureau.

Pre-programmed modules are also available at the service bureau. These come in a variety of subjects and grade levels. For a list of the topics, see Appendix A.

The vendor's claims of the Achip features and benefits are in Appendix B.

A list of the schools, that implemented the Achip Pilot Project along with the number of students and teachers, is outlined in Table 1.

Table 1

List of Achip Pilot Project's Participating Schools

Name of School	Number of Participating Students	Number of Participating Teachers
Breithaupt Career /Technical Ctr.	31	1
Farwell Middle School	124	7
Finney High School	101	2
Golightly Educational Ctr.	116	2
Hannenman Elementary School	124	4
Webber Middle School	159	6
Total	**655**	**22**

BEST COPY AVAILABLE

Methodology

The evaluation of the Achip Pilot Project consists of two parts: (a) a summative evaluation, and (b) a formative evaluation.

The summative evaluation of this study was designed to address two objectives: (a) students participating in the Achip Pilot Project will demonstrate achievement levels on the 1998 Michigan Educational Assessment Program's Test (MEAP) that are higher or comparable to the school wide results, and (b) students participating in the Achip Pilot Project will demonstrate gains in normal curve equivalents (NCE) units on the Metropolitan Achievement Test (MAT 7) from 1997 to 1998 that exceed those of a post hoc matched control group.

In order to complete the evaluation of the first objective, the 1998 Grade 4 and Grade 7 MEAP scores on mathematics and reading were obtained for students participating in the Achip Pilot Project. Frequency distributions were prepared depicting the percent of participants demonstrating satisfactory levels on the MEAP in mathematics and reading as well as the percent demonstrating levels categorized as moderate and low. The MEAP results of the students who participated in the Achip Pilot Project were then compared to the school results.

In order to evaluate the second objective of the summative evaluation, a total of 655 identification numbers of students who participated in the Achip Pilot Project were obtained. All of the six participating schools in the Achip Pilot Project were represented in these identifications. MAT 7 test scores from 1997 and 1998 were then obtained for each student participant in the Achip Pilot Project. Next, a post hoc control group, which was composed of 432 students who were matched on the 1997 MAT 7 total mathematics and reading scores, was obtained. NCE gains for both the treatment and control groups were computed.

Frequency distributions, which were based on NCE gains on the MAT 7 total mathematics, total reading, and science scores from 1997 to 1998, were prepared for the treatment and control groups. An analysis was conducted based on these frequency distributions which reveal the number and percent of students (both the treatment and control groups) achieving a gain of at least three NCE units on the MAT 7, as well as the number and percent achieving a gain greater than zero, but less than three NCE units.

Finally, an independent samples' t-test was applied to the means of the NCE gains on the total mathematics, total reading, and science scores to determine if significant differences existed between the treatment and control groups.

The formative evaluation of this study was designed to address the following objective: classroom teachers of the schools using the Achip unit will evaluate the program positively.

In order to complete the analysis of the formative evaluation, the Office of Research, Evaluation, and Assessment developed a survey with input from the Achip Program Manager. The survey was designed to assess staff members' perceptions regarding:

1) Content of Achip software
2) Presentation of Achip software
3) Support
4) Assessment
5) Management
6) Student Response

7) Achip reprogramming procedures
8) Amount of usage in/out of classrooms
9) Use of Achip in various subject areas

Participating teachers of the Achip Pilot Project were asked to respond to this survey. Sixteen of the total 22 teachers who participated in the Achip Pilot Project responded to this survey (72.7%).

In the process of analyzing the responses of the teacher survey, the questions were grouped according to the above nine categories. Survey results for each question group were tabulated; and displayed in charts and bar graphs.

Findings

In order to evaluate the objective: students participating in the treatment group will demonstrate achievement levels that are higher, or comparable on the MEAP to the school wide results, frequency distributions which reflect the Achip students' performance on the Grade 4 and Grade 7 mathematics and reading tests of the 1998 administration of the MEAP were prepared. The 1998 MEAP scores of the participating Achip students were obtained from two of the six schools that implemented the Achip Pilot Project.

Table 2 shows a frequency distribution based on the Grade 4 Achip students' performance on the MEAP reading test. This table also shows the Grade 4 school results on the reading test.

Table 2

Number and Percent Satisfactory, Moderate, Low on 1998 Grade 4 MEAP Reading Test

	Achip		School	
Categories	**N**	**%**	**N**	**%**
Satisfactory	12	33.3	18	32.7
Moderate	7	19.4	12	21.8
Low	17	47.2	25	45.5
Total	**36**	**99.9***	**55**	**100.0**

*Note. Percent does not total 100% due to rounding.

An analysis of Table 2 shows that the students participating in the Achip Pilot Project achieved at levels that are very similar to the school results. Thirty-three and three tenths percent of the students who participated in the Achip Pilot Project demonstrated satisfactory levels of

achievement on the Grade 4 reading test. This is compared to 32.7% of the students school wide. Table 2 also shows that 19.4% of the students who participated in the Achip Pilot Project demonstrated moderate levels of achievement on the Grade 4 reading test. This is compared to 21.8% of the students school wide. In the low category of the Grade 4 reading test were 47.2% of the students who participated in the Achip Pilot Project. This is compared to 45.5% of the students school wide.

Table 3 shows the results of the frequency distribution based on the Achip students' performance on the 1998 Grade 4 MEAP mathematics test. This table also shows the Grade 4 school wide results on the mathematics test.

Table 3

Number and Percent Satisfactory, Moderate, Low on 1998 Grade 4 MEAP Mathematics Test

	Achip		School	
Categories	**N**	**%**	**N**	**%**
Satisfactory	23	63.9	28	51.9
Moderate	7	19.4	20	37.0
Low	6	16.7	6	11.1
Total	**36**	**100.0**	**54**	**100.0**

An analysis of Table 3 shows that 63.9% of the students who participated in the Achip Pilot Project demonstrated satisfactory levels of achievement on the Grade 4 mathematics test. This is compared to 51.9% of the students school wide.

Table 3 also shows that 19.4% of the students who participated in the Achip Pilot Project demonstrated moderate levels of achievement on the Grade 4 mathematics test. This is compared to 37.0% of the students school wide.

16.7% of the students who participated in the Achip Pilot Project were classified in the low category of the Grade 4 mathematics test. This is compared to 11.1% of the students school wide.

Table 4 shows the results of the frequency distribution based on the participating Achip students' performance on the Grade 7 1998 administration of the MEAP reading test. This table also shows the Grade 7 school results on the reading test.

Table 4

Number and Percent Satisfactory, Moderate, Low on 1998 Grade 7 MEAP Reading Test

	Achip		School	
Categories	**N**	**%**	**N**	**%**
Satisfactory	19	47.5	28	48.3
Moderate	15	37.5	21	36.2
Low	6	15.0	9	15.5
Total	**40**	**100.0**	**58**	**100.0**

An analysis of Table 4 shows that 47.5% of the students who participated in the Achip Pilot Project demonstrated satisfactory levels of achievement on the Grade 7 MEAP reading test, compared to 48.3% of the students school wide. Table 4 also shows that 37.5% of the students who participated in the Achip Pilot Project demonstrated moderate levels of achievement on the Grade 7 reading test, compared to 36.2% of students school wide. In the low category of the Grade 7 reading test were 15.0% of the students who participated in the Achip Pilot Project. This is compared to 15.5% of the students school wide.

Table 5 shows the results of the frequency distribution based on the participating Achip students' performance on the 1998 administration of the Grade 7 MEAP mathematics test. Also, Table 5 shows the Grade 7 school wide results on the mathematics test.

Table 5

Number and Percent Satisfactory, Moderate, Low on 1998 Grade 7 MEAP Mathematics Test

	Achip		School	
Categories	**N**	**%**	**N**	**%**
Satisfactory	39	95.1	56	94.9
Moderate	2	4.9	3	5.1
Low	0	0.0	0	0.0
Total	**41**	**100.0**	**59**	**100.0**

An analysis of Table 5 shows that 95.1% of the students who participated in the Achip Pilot Project demonstrated satisfactory levels of achievement on the Grade 7 MEAP mathematics test, compared to 94.9% of students school wide.

Table 5 also shows that 4.9% of the students who participated in the Achip Pilot Project demonstrated moderate levels of achievement on the Grade 7 mathematics' test, compared to 5.1% of the students school wide. In the low category of the Grade 7 mathematics test were 0.0% of the students who participated in the Achip Pilot Project. This is compared to 0.0% of the students school wide.

In order to evaluate the objective: students participating in the Achip Pilot Project will demonstrate NCE gains on the Metropolitan Achievement Test (MAT 7) from 1997 to 1998 that exceed those of a post hoc matched control group, frequency distributions, which reflected the NCE gains on the total mathematics, total reading, and science, were prepared.

Table 6 shows the results of an analysis of the frequency distribution of NCE gains on the MAT 7 total mathematics test from 1997 to 1998.

Table 6

NCE Gains on the MAT 7-Mathematics from 1997 to 1998

Group	N	NCE Gains			
		Average NCE gain/loss	% of students with NCE gains less than 0	% of students with NCE gains greater than 0, but less than 3	% of students with NCE gains greater than or equal to 3
Achip	375	-3.85	53.3	9.1	37.6
Control	379	-4.75	55.7	8.4	35.9

An analysis of the frequency distribution of NCE gains on the MAT 7 total mathematics test indicates that 37.6% of the students who participated in the Achip Pilot Project obtained a NCE gain of at least three units or more; compared to 35.9% for the control group of students.

Table 6 also shows that 9.1% of the students who participated in the Achip Pilot Project received a NCE gain that was greater than zero, but less than three on the total mathematics test. This is compared to 8.4% for the control group of students.

In reference to the percent of students who received NCE gains less than zero (i.e. a loss in NCE units), 53.0% of the students who participated in the Achip Pilot Project are classified in this category; compared to 55.7% of the students from the control group.

The analysis of the frequency distribution of NCE gains on the MAT 7 total mathematics test indicates an average loss of 3.85 NCE points among the Achip participants; compared to an average loss of 4.75 NCE points among the students in the control group.

A t-test was conducted on the NCE gains on the total mathematics test of the MAT 7 from 1997 to 1998. No significant differences exist between the students who participated in the Achip Pilot Project ($\underline{M}$ = -3.85, $\underline{SD}$ = 19.52) and the control group ($\underline{M}$ = -4.75, $\underline{SD}$ = 21.02), $t(752) = -0.61$, $p > 0.05$.

Figure 1 and Figure 2 illustrate bar graphs of the frequency distributions for the control group and Achip students' NCE gains on the MAT 7 total mathematics test from 1997 to 1998.

Figure 1

NCE Gains on MAT 7-Mathematics

Control Group

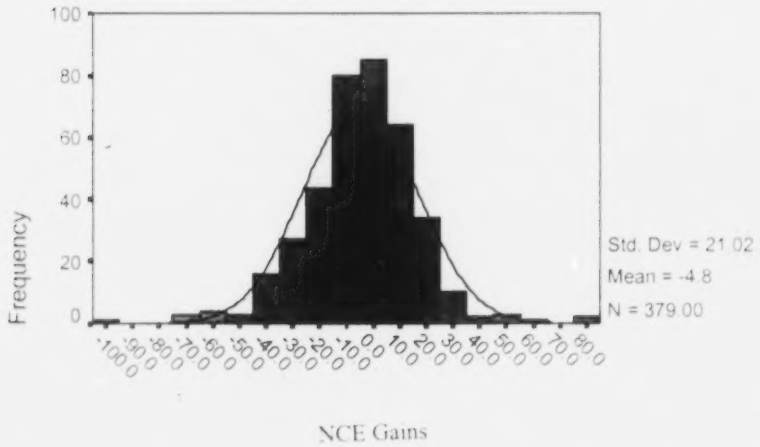


Figure 2

NCE Gains on MAT 7-Mathematics

Achip Students

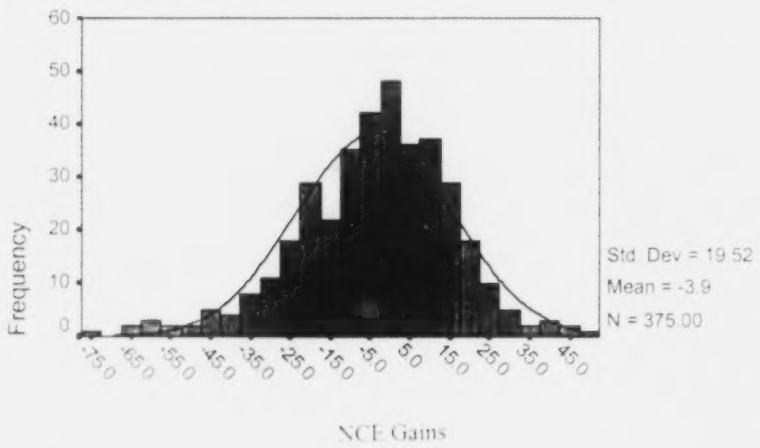


Table 7 shows the results of an analysis of the frequency distribution of NCE gains on the MAT 7 total reading test from 1997 to 1998.

Table 7:

NCE Gains on the MAT 7-Reading from 1997 to 1998

Group	N	NCE Gains			
		Average NCE gain/loss	% of students with NCE gains less than 0	% of students with NCE gains greater than 0, but less than 3	% of students with NCE gains greater than or equal to 3
Achip	375	-3.11	54.7	11.7	33.6
Control	379	-4.34	59.4	7.9	32.7

An analysis of the frequency distribution of NCE gains on the total reading test indicates that 33.6% of the students who participated in the Achip Pilot Project received a NCE gain of at least three units or more; compared to 32.7% for the control group of students.

Table 7 also shows that 11.7% of the students who participated in the Achip Pilot Project received a NCE gain that was greater than zero, but less than three on the total reading component of the MAT 7. This is compared to 7.9 % for the control group of students.

In reference to the percent of students who received NCE gains less than zero (i.e. a loss in NCE units), 54.7% of the students who participated in the Achip Pilot Project are classified in this category; compared to 59.4% of the students from the control group.

The analysis of the frequency distribution of NCE gains on the total reading test of the MAT 7 indicates an average loss of 3.11 NCE points among Achip participants; compared to an average loss of 4.34 NCE points among the students in the control group.

A t-test was conducted on the NCE gains on the total reading test of the MAT 7 from 1997 to 1998. No significant differences exist between the students who participated in the Achip Pilot Project (M = -3.11, SD = 16.33) and the control group (M = -4.34, SD = 18.39), $t(752) = 0.96$, $p > 0.05$.

Figure 3 and Figure 4 illustrate bar graphs of the frequency distributions for the control group and Achip students' NCE gains on the MAT 7 total reading test from 1997 to 1998.

BEST COPY AVAILABLE

Figure 3

NCE Gains on MAT 7-Reading

Control Group

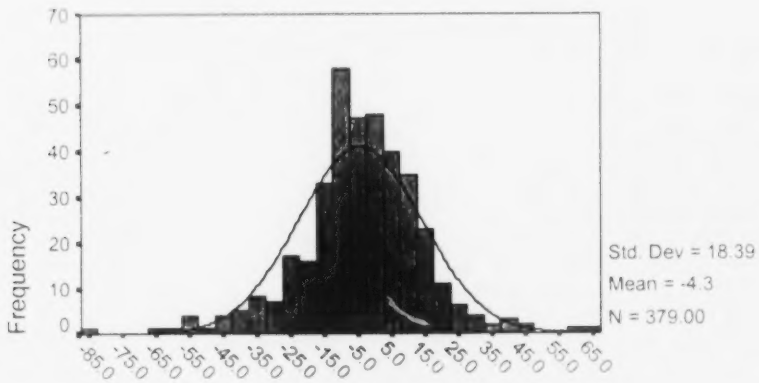


Figure 4

NCE Gains on MAT 7-Reading

Achip Students

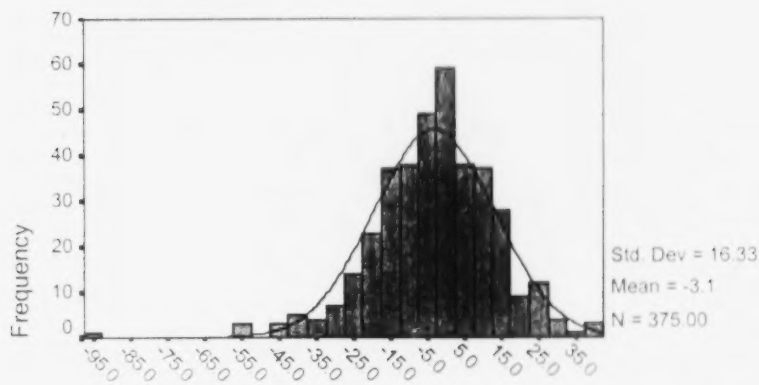


Table 8 shows the results of an analysis of the frequency distribution of NCE gains on the MAT 7 science test from 1997 to 1998.

Table 8

NCE Gains on the MAT 7-Science from 1997 to 1998

Group	N	NCE Gains			
		Average NCE gain/loss	% of students with NCE gains less than 0	% of students with NCE gains greater than 0, but less than 3	% of students with NCE gains greater than or equal to 3
Achip	375	-12.79	67.7	7.2	25.1
Control	379	-5.03	60.2	7.3	32.5

An analysis of the frequency distribution of NCE gains on the MAT 7 science test indicates that 25.1% of the students who participated in the Achip Pilot Project received a NCE gain of at least three or more; compared to 32.5% for the control group of students.

Table 8 also shows that 7.2% of the students who participated in the Achip Pilot Project received a NCE gain that was greater than zero, but less than three on the science test. This is compared to 7.3% for the control group of students.

In reference to the percent of students who received NCE gains less than zero (i.e. a loss in NCE units), 67.7% of the students who participated in the Achip Pilot Project are classified in this category; compared to 60.2% of the students from the control group.

The analysis of the frequency distribution of NCE gains on the science test indicates an average loss of 12.79 NCE units among the Achip participants; compared to an average loss of 5.03 NCE units among the students in the control group.

A t-test was conducted on the 1997 NCE science scores of the MAT 7. A significant difference existed between the students who participated in the Achip Pilot Project ($M = 43.20$, $SD = 22.31$), $t(862) = -2.17$, $p<0.05$ and the control group ($M = 46.65$, $SD = 24.42$).

Figure 5 and Figure 6 illustrate bar graphs of the frequency distributions for the control group and Achip students' NCE gains on the MAT 7 science test from 1997 to 1998.

Figure 5

NCE Gains on MAT 7-Science

Control Group

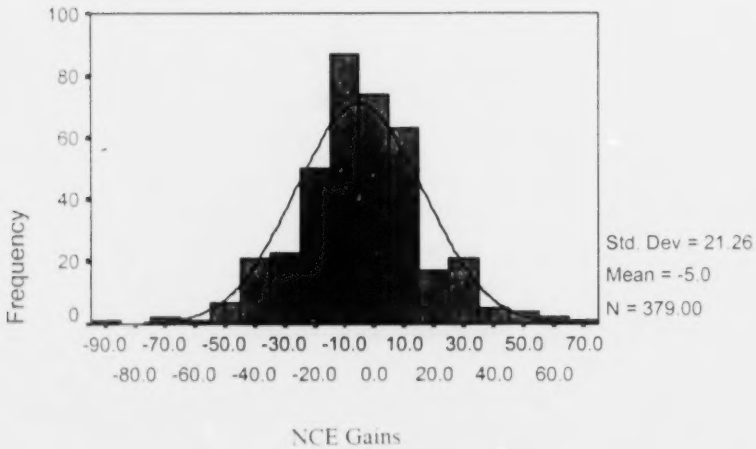
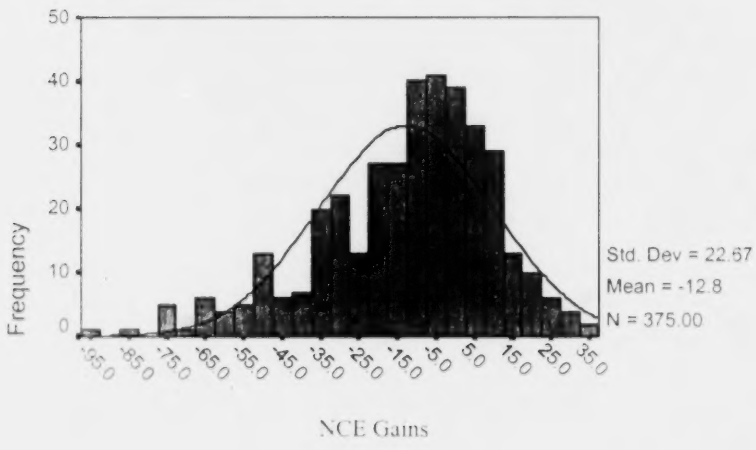


Figure 6

NCE Gains on MAT 7-Science

Achip Students



An analysis of variance test (ANOVA) was conducted on the 1998 NCE science scores of the MAT 7, controlling for the NCE scores on the 1997 MAT 7 science test. The ANOVA identified a significant difference between the students who participated in the Achip Pilot Program and the control group. The Achip students lost more NCE units on the MAT 7 science test (-12.79) than the control group (-5.03). For a view of the figures from the ANOVA test, see Table 9.

Table 9

Analysis of Variance for 1998 MAT 7

	NCE scores	
Source	**df**	**F**
NCE Science	1	232.69*
Achip Participation	1	21.39*
s within-group error	751	(30291.00)

*Note. Value enclosed within parentheses represent mean square error. s = subjects. *$p<0.05$.

FORMATIVE EVALUATION

In order to evaluate the objective: classroom teachers of the schools using the Achip unit will evaluate the program positively, participating teachers of the Achip Pilot Project were asked to respond to a survey regarding their perceptions about the Achip Pilot Project. Sixteen teachers out of the total 22 teachers who participated in the Achip Pilot Project responded to the survey.

The survey began with questions asking the teacher to identify the grade level, subject, learning strategies, and setting in which they used the Achip device. They were also asked to identify the percent of their students using the Achip.

The questionnaire was designed to assess staff members' perception regarding:

1) Content of Achip software
2) Presentation of Achip software
3) Support
4) Assessment
5) Management
6) Student response
7) Achip Reprogramming procedures
8) Amount of Achip usage among students
9) Use of the Achip unit in various subject areas

For each item, teachers were asked to respond to survey questions on a scale of zero (0) to three (3). The lowest rating is zero; the highest rating is three.

In the process of analyzing the responses to the teacher survey, the questions were grouped according to the above categories. Bar graphs that reflect a summary of the teachers' responses for categories one through seven are in Appendix C.

Content of Achip Software

Ten items on the teacher survey were related to the software content of the Achip unit. The mean of the teachers' responses for these items ranged from 2.67 to 2.91 on a scale of zero to three. This implies that overall; the teachers were quite satisfied with the content of the Achip software.

Table 10 summarizes teachers' responses to the survey questions referring to the content of the Achip software.

Table 10

Summary of Teacher Responses to Content Item Group

Survey Items (12-21)	Frequencies (%)				N	M	SD
	Rated 0	Rated 1	Rated 2	Rated 3			
12 Supports range of developmentally appropriate options	0.0	0.0	30.8	69.2	9	2.69	0.48
13 Provides performance-based learning situations	0.0	0.0	28.6	71.4	10	2.71	0.47
14 Supports academic expectations	0.0	0.0	20.0	80.0	12	2.80	0.41
15 Uses developmentally appropriate vocabulary	0.0	0.0	20.0	80.0	12	2.80	0.41
16 Addresses various learning styles and intelligences	0.0	7.1	14.3	78.6	11	2.71	0.61
17 Adapts to interest ability	0.0	0.0	20.0	80.0	12	2.80	0.41
18 Facilitates integration of technology into instruction	0.0	0.0	33.3	66.7	10	2.67	0.49
19 Uses instructional strategies based on current research	0.0	0.0	26.7	73.3	11	2.73	0.46
20 Lacks bias (social, ethnic, racial, religious)	0.0	0.0	9.1	90.9	10	2.91	0.30
21 Presents accurate and current information	0.0	0.0	21.4	78.6	11	2.79	0.43

Item #20 received the most positive response with 90.9% of the teachers surveyed rating the statement: "Lacks bias (social, ethnic, racial, religious, and gender)" a three. Conversely, item #18 received the lowest positive response rate. An analysis of this item shows that 66.7% of the teachers who were surveyed rated the statement: Facilitates integration of technology into instruction" a three.

Presentation of Achip Software

Ten items on the teacher survey were related to the presentation of the Achip software. The mean of the teachers' responses for these items ranged from 2.18 to 2.93 on a scale of zero to three. This implies that overall; the teachers were satisfied with the presentation of the Achip software.

Table 11 summarizes teachers' responses to the survey questions referring to the presentation of the Achip software.

Table 11

Summary of Teacher Responses to Presentation Item Group

Survey Items (22-31)	Frequencies (%) Rated 0	Rated 1	Rated 2	Rated 3	N	M	SD
22. Presents materials in an organized manner	0.0	0.0	6.7	93.3	14	2.93	0.26
23. Provides consistent, easy-to use on screen instructions	0.0	13.3	20.0	66.7	10	2.53	0.74
24. Provides developmentally appropriate presentation format	0.0	0.0	26.7	73.3	11	2.73	0.46
25. Addresses the needs of limited English-proficiency students	0.0	27.3	27.3	45.5	5	2.18	0.87
26. Provides appropriate feedback to student response	0.0	7.1	21.4	71.4	10	2.64	0.63
27. Adapts to different learning environments (individual, small, and large group)	7.1	0.0	7.1	85.7	12	2.71	0.83
28. Runs smoothly, without long delays	0.0	0.0	26.7	73.3	11	2.73	0.46
29. Employs accurate grammar and spelling	0.0	0.0	15.4	84.6	11	2.85	0.38
30. Presents easy to view text	0.0	0.0	26.7	73.3	11	2.73	0.46
31. Avoids unnecessary screens	0.0	0.0	28.6	71.4	10	2.71	0.47

Item #22 received the most positive responses with 93.3% of the teachers surveyed rating the statement: "Presents materials in an organized manner" a three. Conversely, item #25 received the lowest positive response rate with 45.5% of the teachers who were surveyed rating the statement, "Addresses the needs of limited English-proficiency students" a three.

Also, 66.7% of the teachers who were surveyed rated the statement, "Provides easy-to-use on screen instructions" a three.

Support

Four items on the teacher survey were related to the capability of the Achip unit to supplement and support classroom instruction and activities. The mean of the teachers' responses for these items ranged from 2.38 to 2.73 on a scale of zero to three. This implies that overall the teachers were satisfied with the support capabilities of the Achip unit.

Table 12 summarizes the teachers' responses to the survey questions referring to the support capabilities of the Achip unit.

Table 12

Summary of Teacher Responses to Support Item Group

	Frequencies (%)						
Survey Items (32-35)	**Rated 0**	**Rated 1**	**Rated 2**	**Rated 3**	**N**	**M**	**SD**
32. Provides a variety of learning ideas	7.7	0.0	38.5	53.8	7	2.38	0.87
33. Are well-organized and easy to use	0.0	0.0	26.7	73.3	11	2.73	0.46
34. Incorporates various presentation methods	0.0	7.7	46.2	46.2	6	2.38	0.65
35. Includes materials for extended, enrichment, and remedial activities	7.7	0.0	30.8	61.5	8	2.46	0.88

Item #33 received the most positive responses with 73.3% of the teachers surveyed rating the statement: "Are well-organized and easy to use" a three. Conversely, item #34 received the lowest positive response rate with 46.2% of the teachers who were surveyed rating the statement, "Incorporates various presentation methods" a three.

Assessment

Four items on the teacher survey were related to the assessment capabilities of the Achip unit. The mean of the teachers' responses for these items ranged from 2.14 to 2.64 on a scale of zero to three. This implies that overall the teachers were satisfied with the assessment capabilities of the Achip unit.

Table 13 summarizes teachers' responses to the survey questions referring to the assessment capabilities of the Achip unit.

Table13

Summary of Teacher Responses to Assessment Item Group

	Frequencies (%)						
Survey Items (36-39)	**Rated 0**	**Rated 1**	**Rated 2**	**Rated 3**	**N**	**M**	**SD**
36. Promotes open-ended response and or portfolio opportunities	7.1	14.3	35.7	42.9	6	2.14	0.95
37. Allows students to apply their knowledge and skills in real-life situations	0.0	7.7	30.8	61.5	8	2.54	0.66
38. Promotes collaborative learning experiences	0.0	7.1	21.4	71.4	10	2.64	0.63
39. Provides a variety of assessments, where appropriate	0.0	6.7	33.3	60.0	9	2.53	0.64

Item #38 received the most positive responses with 71.4% of the teachers who were surveyed rating the statement, "Promotes collaborative learning experiences" a three. Conversely, item #36 received the lowest positive response rate with 42.9% of the teachers who were surveyed rating the statement, "Promotes open-ended response and or portfolio opportunities" a three.

Management

Five items on the teacher survey were related to the management of the Achip unit and software. The mean of the teachers; responses ranged from 2.09 to 2.80 on a scale of zero to three. This implies that overall, the teachers were satisfied with the management of the Achip unit and software.

Table14 summarizes teachers' responses to survey questions referring to the management of the Achip unit and software.

Table 14

Summary of Teacher Responses to Management Item Group

Survey Items (40-44)	Frequencies (%) Rated 0	Rated 1	Rated 2	Rated 3	N	M	SD
40. Allows customizing for individual learning	0.0	0.0	20.0	80.0	12	2.80	0.41
41. Allows student to exit and resume at a later time	13.3	6.7	13.3	66.7	10	2.33	1.11
42. Keeps student performance record, where appropriate	9.1	18.2	27.3	45.5	5	2.09	1.04
43. Allows teacher control of appropriate aspects of the software	22.2	0.0	22.2	55.6	5	2.11	1.27
44. Allows student control of appropriate aspects of the software	7.1	0.0	28.6	64.3	9	2.50	0.85

Item #40 received the most positive responses with 80.0% of the teachers surveyed rating the statement: "Allows customizing for individual learning needs" a three. Conversely, item #42 received the lowest positive response rate with 45.5% of the teachers who were surveyed rating the statement, "Keeps student performance record, where appropriate" a three.

Student Response

Four items on the teacher survey were related to the student response aspects of the Achip unit. The mean of the teachers' responses for these items ranged from 2.60 to 2.80 on a scale of zero to three. This implies that overall the teachers were satisfied with the student response capabilities of the Achip unit. Table 15 summarizes teachers' responses referring to the student response capabilities of the Achip unit

Table 15

Summary of Teacher Responses to Student Response Item Group

	Frequencies (%)						
Survey Items (45-48)	**Rated 0**	**Rated 1**	**Rated 2**	**Rated 3**	**N**	**M**	**SD**
45. Engages the learner	0.0	0.0	20.0	80.0	12	2.80	0.41
46. Encourages active learning	0.0	0.0	26.7	73.3	11	2.73	0.46
47. Generates positive responses	0.0	0.0	20.0	80.0	12	2.80	0.41
48. Yields measurable learning	0.0	6.7	26.7	66.7	10	2.60	0.63

Item #45 and item #47 received the most positive responses with 80.0% of the teachers surveyed rating the statements: "Encourages the learner" and "Generates positive responses" a three. Conversely, item #48 received the lowest positive response rate with 66.7% of the teachers who were surveyed rating the statement, "Yields measurable learning".

Achip Pilot Project's Reprogramming Procedures

Four items on the teacher survey were related to the Achip Pilot Project's reprogramming procedures. The mean of the teachers' responses for these items ranged from 2.09 to 2.75 on a scale of zero to three. This implies that overall, the teachers were satisfied with the reprogramming procedures.

Table 16 summarizes the teachers' responses to the survey questions referring to the Achip Pilot Project's reprogramming procedures.

Table 16

Summary of Teacher Responses to Reprogramming Item Group

	Frequencies (%)						
Survey Items (49-52)	**Rated 0**	**Rated 1**	**Rated 2**	**Rated 3**	**N**	**M**	**SD**
49. The reprogramming process is easy.	9.1	9.1	45.5	36.4	4	2.09	0.94
50. The reprogramming process is orderly and businesslike	0.0	0.0	25.0	75.0	9	2.75	0.45
51. The reprogramming process is completed on time.	7.7	7.7	38.5	46.2	6	2.23	0.93
52. The reprogramming is accurate.	0.0	0.0	46.2	53.8	7	2.54	0.52

Item #50 received the most positive responses with 75.0% of the teachers surveyed rating the statement: "The reprogramming process is orderly and businesslike" a three. Conversely, item #49 received the lowest positive response with 36.4% of the teachers, who were surveyed rating the statement, "The reprogramming process is easy" a three. Also, 53.8% of the teachers surveyed rated the statement, "The reprogramming is accurate" a three.

Percentage of Students Using the Achip Unit

Table 17 indicates the percentage of teachers who responded to item #5 in the survey: "What percent of your students used the Achip?"

Table 17

Summary of Teacher Responses to Item #5: What percent of your students used the Achip?

Item Choices (%)	N	Teacher Response (%)
None	0	0.0
1 to 10	1	7.1
11 to 20	0	0.0
21 to 30	0	0.0
31 to 40	1	7.1
41 to 50	1	7.1
51 to 75	4	28.6
More than 75	7	50.0
Total	14	99.9*

*** Percent does not total 100% due to rounding**

Table 17 shows that 50% of the teachers who were surveyed responded that more than 75% of their students used the Achip unit. This was followed by 28.6% of the teachers who responded that 51% to 75% of their students used the Achip unit.

Figure 7 summarizes the teachers' responses to survey item #5: What percentage of your students used the Achip unit?

Figure 7

Summary of Teacher Responses to Survey Item #5: What percentage of your students used the Achip unit?

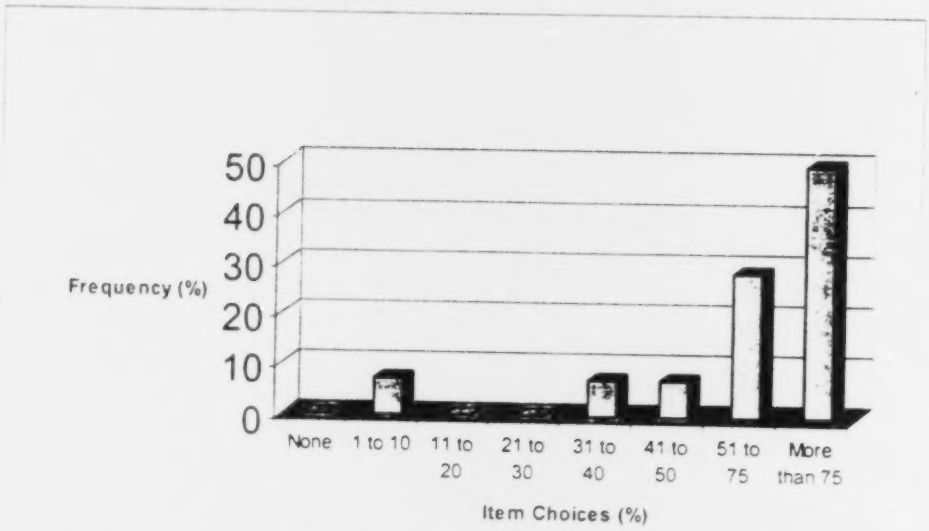


Table 18 indicates the percentage of teachers who responded to item #6 in the survey, "How often did your students use the Achip units?"

Table 18

Summary of Teacher Responses to Item #6: How often did your students use the Achip units?

Item Choices	N	Teacher Responses (%)
Frequently (2 times a week)	7	46.7
Often (at least once a week)	2	13.3
Somwhat Often (at least twice a month)	5	33.3
Rarely (Maybe once a month)	1	6.7
Never	0	0.0
Total	15	99.9*

*Percent does not total 100% due to rounding.

Table 18 shows that 46.7% of the teachers who were surveyed responded that their students used the Achip unit frequently (twice a week). This was followed by 33.3% of the teachers who responded that their students used the Achip unit somewhat often (at least twice a month). Also, 13.3 % of the teachers who were surveyed responded that their students used the Achip often (at least once a week).

Table 19 indicates the percentage of teachers who responded to item #8 in the survey: "Are students using the Achip units in more than one class?"

Table 19

Summary of Teacher Responses to Item # 8: Are students using the Achip units in more than one class?

Item Choices	N	Teacher Response (%)
Not at all	2	13.3
1 other class	5	33.3
2-3 other classes	3	20.0
More than three	3	20.0
Don't know	2	13.3
Total	15	99.9*

* Percent does not total 100% due to rounding.

Table 19 shows that 33.3% of the teachers who were surveyed responded that their students were using the Achip unit in one other class. This was followed by 20% of teachers who responded that their students were using the Achip in two to three other classes, and 20% of teachers responded that their students were using the Achip in more than three classes.

Use of Achip unit in various subject areas

Table 20 indicates the percentage of teachers who identified the subject areas in which the Achip unit was used.

Table 20

Summary of Teacher Responses to Use of Achip Unit in Various Subject Areas (Survey item #2)

Subject	N	Teacher Responses (%)
Homeroom	1	6.7
Language Arts	3	20.0
Mathematics	4	26.7
Physical Education	0	0.0
Science	6	40.0
Social Studies	5	33.3
Other	0	0.0
Total	**19**	*

*Note: Multiple answers can total over **100%**

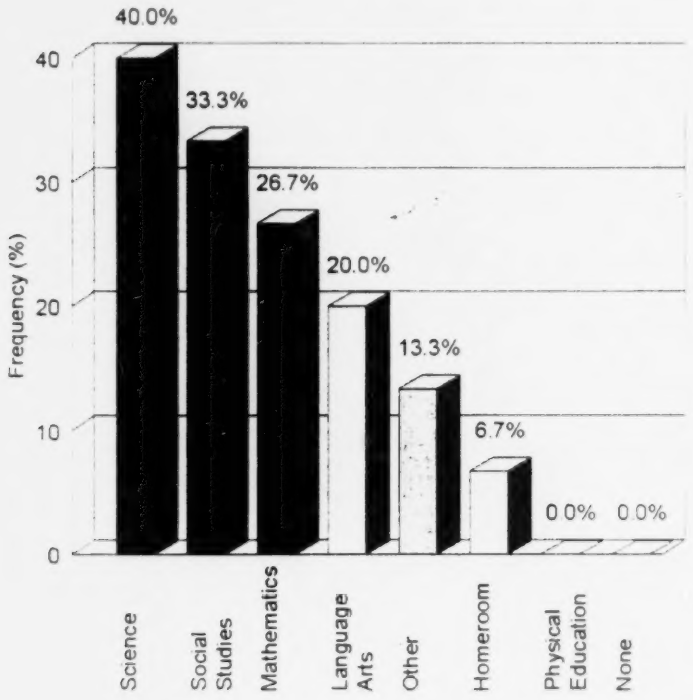
An analysis of Table 20 and the corresponding bar graph shows that the highest percentage of teachers (40%) identified science as being the subject area in which the Achip unit was used. The next highest percentage of teachers (33.3%) identified social studies in which the Achip unit was used. This was followed by mathematics in which 26.7% of teachers identified as being the subject area that the Achip unit was used.

Figure 8 summarizes the results of teachers' responses to the use of the Achip unit in various subject areas.

With regard to the pre-programmed modules that teachers have used with their students, the highest percentage of teachers (44.4%) responded that they have used the Earth Science Introduction module. The next highest percentage of teachers (33.3%) responded that they have used the Introduction to Space, Oceans and Science, Plants in Our Biosphere, and SAT 1 Verbal Review modules. For a complete listing of the teachers' responses to the use of pre-programmed modules, see item #53 of the Achip Pilot Survey Report in Appendix C.

Figure 8

Summary of Teacher Responses to Use of Achip Unit in Various Subject Areas



* Note: Multiple answers can total over 100%.

Discussion of Open Ended Survey Items

There were five open ended items on the Achip Pilot Project survey (items #54-#58). The responses to these items are in Appendix C in the summary text report.

When the teachers were asked to complete the sentence (item #54), "When my students used the Achip, they...", all of the responses were positive. The teachers indicated that the students were excited and highly motivated to use the Achip unit.

With regard to the participating teachers' perceptions of the good and bad features of the Achip unit (items #55 and #56 respectively), eight teachers out of the fourteen who responded to item #55 indicated that the Achip unit was easy to use and manipulate. In reference to the bad features of the Achip unit, four teachers out of the ten who responded indicated that the screen needs to be larger and that it clears too fast to evaluate student progress.

When the teachers of the Achip Pilot Project were asked if they would recommend the Achip unit to other teachers (item #57), all responded positively. Some of the reasons that the teachers cited for recommending the Achip unit to other teachers were a) the unit's capacity to be

utilized as an instructional tool, b) the integration of technology in the classroom, and c) the high motivational level of students when using the unit.

In response to item #58: Is this the best medium for presenting the material, nine out of the twelve respondents gave favorable responses, while three were negative.

In the additional comments and tips section of the survey, teachers recommended that: a) the Achip unit could be used in conjunction with an overhead projector, b) the reprogramming process be improved, c) the Achip unit's screen be improved so that teachers could view the latest score, and d) more pre-programmed modules be provided.

Conclusions and Recommendations

Two conclusions were found based on the findings from the analysis of the objective: students participating in the Achip Pilot Project will demonstrate achievement levels on the 1998 MEAP test that are higher or comparable to the school wide results.

On the Grade 4 MEAP reading and mathematics tests, the students who participated in the Achip Pilot Project demonstrated achievement levels that are comparable to the school results in the satisfactory, moderate, and low categories.

On the Grade 7 MEAP reading and mathematics tests, the students who participated in the Achip Pilot Project demonstrated achievement levels that are comparable to the school results in the satisfactory, moderate, and low categories.

Based on the findings from the analysis of the objective: students participating in the Achip Pilot Project will demonstrate NCE gains on the MAT 7 that exceed those of a post hoc matched control group, it is concluded that the students who participated in the Achip Pilot Project did not demonstrate NCE gains that exceed those of a control group. On the mathematics and reading sections of the MAT 7, it was verified that no significant differences exist between the students participating in the Achip Pilot Project and the control group. On the science section of the MAT 7, it was found that the students participating in the Achip Pilot Project lost significantly more NCE units (12.79) than the control group (5.03) on average.

Also, students participating in the Achip Pilot Project lost NCE units on the MAT 7 total mathematics (3.85), total reading (3.11), and science (12.79) sections from 1997 to 1998.

As a result of the conclusions that were found regarding the analysis of the objectives regarding the MEAP and MAT 7 tests, it is recommended that ad hoc committees evaluate any future agreements with the Achip Company. This committee would include principals, curriculum specialists, curriculum supervisors, technology consultants, and members of the research and evaluation team. Issues to be considered by this committee include the following: (a) teacher inservice training, and (b) alignment of Achip pre-programmed software to the district's core curriculum objectives.

These committees would insure that teacher inservice training, that would assist the teachers on how to effectively integrate the Achip unit in the facilitation of MEAP and MAT 7 learning objectives, were indeed scheduled and that all teachers who participate in the Achip Pilot Project are aware of them. Also, these committees would illustrate how the Achip's pre-programmed software supports and is in alignment with the district's core curriculum objectives.

Based on the findings from the formative evaluation, classroom teachers of the schools using the Achip unit evaluated the program positively. In each of the nine categories that the survey questions were grouped, it was found that the average response of the classroom teachers ranged from 2.09 to 2.93 on a scale of zero to three. Recommendations have been formulated for each survey question group.

In reference to the survey question group regarding the content of the Achip software, it is recommended that Achip developers and participating teachers work together in an effort to improve the integration of the Achip unit *during* classroom instruction, rather than after the material has been taught.

One way in which this recommendation could be facilitated is to have teachers list the features that are needed to exist on the Achip unit and or software which would improve the unit's capacity to be utilized during instruction. This list would then be submitted to Achip developers for an analysis of its' feasibility.

In reference to the survey question group regarding the presentation of the Achip software, Achip developers need to improve the unit's capacity to address the needs of limited English-proficient students by adjusting the Achip unit and its' software appropriately. Also, it is recommended that Achip developers review on-screen instructions in an effort to improve the unit's capacity to make instructions consistent and easy-to-use.

With regard to the survey question group regarding support, Achip developers need to improve the incorporation of various presentation methods in the Achip unit in an effort to appeal to students with various learning styles. Also, it is recommended that Achip developers work with participating teachers in order to improve a variety of learning ideas on Achip software that is used for extended, enrichment, and remedial activities.

In reference to the survey question group regarding assessment, Achip developers and teachers (when they develop exercises for reprogramming) should include exercises, which require open-ended responses. Also, it is recommended that Achip developers review pre-programmed modules in an effort to improve applications to real life situations. At the same time, teachers who submit exercises to be reprogrammed on the Achip unit are encouraged to include exercises that allow students to apply their knowledge and skills in real-life situations.

Finally, it is recommended that the Achip developers work with participating teachers in order to include an increased variety of assessment capabilities of the unit.

The analysis of the survey question group regarding the management of the Achip unit points to three recommendations. First, the Achip developers need to improve the unit's capability to maintain a given student's performance record on a particular exercise or quiz *after* that student exits the exercise or quiz. Second, Achip developers need to improve teacher and student control of appropriate aspects of the software (e.g. turning the sound off). Third, it is recommended that Achip developers improve the unit's capability to allow students to exit software and resume at a later time.

With regard to the student response survey question group, Achip developers need to improve the unit's capacity to yield measurable student learning by adjusting how the unit reports to students of their progress.

In reference to the survey question group regarding the Achip Pilot Project's reprogramming procedures, this process needs to be easier, more accurate, and timely. Also, it is recommended that Detroit Public Schools' curriculum specialists and supervisors review the Achip pre-programmed modules to test their alignment with the district's core curriculum objectives.

In terms of the amount of Achip unit usage in and outside of the classroom (Tables 17 and 18), as well as in various subject areas (Tables 19 and 20), it is recommended that a level of student participation regarding these issues is set by a committee composed of: Achip Pilot Project teachers, technology consultants, curriculum specialists, and curriculum supervisors. The task of this committee would be to set the minimum amount of time that the Achip unit is to be used in the classroom to constitute participation. Also, this committee would address the issue of identifying subject areas in which the Achip unit would best be utilized. Further research needs to be conducted investigating which subject areas encompass the most and least growth in student achievement as a result of using the Achip unit.

BEST COPY AVAILABLE

APPENDIX A

ACHIP COMPANY'S LIST OF PRE-PROGRAMMED COMPUTER CHIPS

ACHIP COMPANY'S LIST OF PRE-PROGRAMMED COMPUTER CHIPS

1. Math Review for Grades 2-4
2. Math Word Problems for Grades 2-4
3. Math Review for Grades 5 and 6
4. Reading Comprehension for Grades 3-4
5. Word Exercises and Review for Grades 3-4
6. Reading Comprehension Exercises for Grades 5 and 6
7. Vocabulary Guide
8. Earth Science Introduction
9. Introduction to Space
10. Oceans and Science
11. Plants in Our Biosphere
12. Knowledge Checker
13. The United States Constitution
14. African American Leadership
15. SAT Verbal Review
16. GED Verbal Review
17. Golf Rules, Etiquette and Lingo
18. Fast Food Menus and Nutrition Guide
19. Health and Nutrition Trivia Games
20. Travel Trivia

APPENDIX B

ACHIP COMPANY'S CLAIMS OF ACHIP UNIT'S FEATURES AND BENEFITS

Achip Company literature states the following:

The Achip system gives educators a new tool for teaching with the following benefits:

- It gets the students' attention. This medium is exciting and easy to use.
- Every student can have one, providing equal time benefit for all students.
- Allows students to learn at their own pace, and provides feedback to assist in study efforts.
- Great for field trips, so students can have portable databases without transporting books or computers.
- Instructors can create their own electronic tutorial program to improve student academic performance.
- Educators can publish their work on Achip Info-Chip Doors ™ for U.S. distribution and royalty opportunities.
- Achip ICPro-grammer gives educators an unlimited library of educational topics to choose from in less than 30 seconds.

The vendor further claims the following as benefits to students:

- Short learning curve-to become confident with technology.
- Reading phobias are reduced with the use of 4 lines, 25 characters per line (100 characters per screen)
- Scrolling can be full screen or line by line. Students with reading difficulties can alter their approach to reading difficult material, until they are more comfortable.
- Students (at service bureau) can create their own informational chips or databases.
- It's fun! Students will enjoy the technology.
- Students can share this technology with parents; and get them involved in their education process, even if they do not have a computer at home.

The vendor describes the benefits to the institution as low cost-high impact in that:

- This technology augments previously technology investments.
- This technology can service the needs of a large student population, more cost effectively.
- This technology will produce equal to or higher educational benefits, than current computer systems.

BEST COPY AVAILABLE

APPENDIX C

SURVEY DISTRIBUTED TO TEACHERS PARTICIPATING IN THE ACHIP PILOT PROJECT

BAR GRAPHS REFLECTING TEACHER RESPONSES TO SURVEY ITEM GROUPS

SUMMARY REPORT OF TEACHERS RESPONSES TO SURVEY QUESTIONS

A-CHIP PILOT
TEACHER SURVEY

School Name _____

Please respond to the following questions regarding your school's participation in the A-Chip Pilot. Your candid opinions regarding the program will assist the district in future planning. Please return all completed surveys to Harvey Czerwinski in the Office of Research, Evaluation and Assessment in the Marie Farrell-Donaldson Building by May 29, 1998. Surveys may also be faxed at 494-2669.

1. **Please identify the grade level that you teach. (Darken all that apply.)**

❑ Kdg ❑ 1 ❑ 2 ❑ 3 ❑ 4 ❑ 5 ❑ 6 ❑ 7 ❑ 8 ❑ 9 ❑ 10 ❑ 11 ❑ 12 ❑ Other

2. **In what subjects did you use the A-Chip units?**

❑ Homeroom ❑ Language Arts ❑ Mathematics ❑ Science ❑ Physical Education ❑ Social Studies ❑ None ❑ Other

3. **For what types of learning strategies or purposes did you use the A-Chip units? (Darken all that apply.)**

❑ Drill & Practice ❑ Tutorial ❑ Problem Solving ❑ Exploratory ❑ Simulation ❑ Creativity ❑ Management ❑ Critical Thinking ❑ Interdisciplinary ❑ Utility
❑ Other: _____

4. **In what setting did you use the A-Chip Units most frequently? (Darken only one.)**

❑ Individual ❑ Small Group ❑ Large Group/Whole Class ❑ Homework
❑ Other: _____

5. **What percentage of your students used the A-Chip units?**

❑ None ❑ 1 to 10 ❑ 11 to 20 ❑ 21 to 30 ❑ 31 to 40 ❑ 41 to 50 ❑ 51 to 75 ❑ More than 75

6. **How often did your student's use the A-Chip units?**

❑ Frequently (2 times a week) ❑ Often (At least once a week) ❑ Somewhat Often (At least twice a month) ❑ Rarely (Maybe once a month) ❑ Never

7. **To what extent did you share the A-Chip units with other teachers?**

❑ Frequently (2 times a week) ❑ Often (At least once a week) ❑ Somewhat Often (At least twice a month) ❑ Rarely (Maybe once a month) ❑ Never

8. **Are students using the A-Chip units in more than one class?**

❑ Don't know ❑ Not at all ❑ 1 other class ❑ 2-3 other classes ❑ More than three

9. **How did your students' use of the A-Chip units positively affect the continuity of instruction in your classroom?**

❑ A great deal ❑ A little ❑ Not at all

10. **How frequently were your students allowed to take the A-Chip units home?**

❑ Frequently (2 times a week) ❑ Often (At least once a week) ❑ Somewhat Often (At least twice a month) ❑ Rarely (Maybe once a month) ❑ Never

11. **How many times did you have the A-Chip units re-programmed?** ..... _____

43

Please complete the following checklist to rate the quality of the software programmed on the A-Chip units. Beside each item, please circle the number to indicate your rating of this software, or indicate if that item is not applicable. The lowest rating is 0, the highest rating is 3, and "not applicable" is NA.

Content

12. Supports range of developmentally appropriate options	0 1 2 3	NA
13. Provides performance-based learning situations	0 1 2 3	NA
14. Supports academic expectations	0 1 2 3	NA
15. Uses developmentally appropriate vocabulary	0 1 2 3	NA
16. Addresses various learning styles and intelligences	0 1 2 3	NA
17. Adapts to interest/ability	0 1 2 3	NA
18. Facilitates integration of technology into instruction	0 1 2 3	NA
19. Uses instructional strategies based on current research	0 1 2 3	NA
20. Lacks bias (social, ethnic, racial, religious and gender)	0 1 2 3	NA
21. Presents accurate and current information	0 1 2 3	NA

Presentation

22. Presents materials in an organized manner	0 1 2 3	NA
23. Provides consistent, easy-to-use on screen instructions	0 1 2 3	NA
24. Provides developmentally appropriate presentation format	0 1 2 3	NA
25. Addresses the needs of limited English-proficiency students	0 1 2 3	NA
26. Provides appropriate feedback to student response	0 1 2 3	NA
27. Adapts to different learning environments (individual, small and large group)	0 1 2 3	NA
28. Runs smoothly, without long delays	0 1 2 3	NA
29. Employs accurate grammar and spelling	0 1 2 3	NA
30. Presents easy to view text	0 1 2 3	NA
31. Avoids unnecessary screens	0 1 2 3	NA

Support

32. Provide a variety of learning ideas	0 1 2 3	NA
33. Are well-organized and easy to use	0 1 2 3	NA
34. Incorporate various presentation methods	0 1 2 3	NA
35. Include materials for extended, enrichment and remedial activities	0 1 2 3	NA

Assessment

36. Promotes open-ended response and/or portfolio opportunities	0 1 2 3	NA
37. Allows students to apply their knowledge and skills in real-life situations	0 1 2 3	NA
38. Promotes collaborative learning experiences	0 1 2 3	NA
39. Provides a variety of assessments, where appropriate	0 1 2 3	NA

Management

40. Allows customizing for individual learning needs	0 1 2 3	NA
41. Allows student to exit and resume at a later time	0 1 2 3	NA
42. Keeps student performance record, where appropriate	0 1 2 3	NA
43. Allows teacher control of appropriate aspects of the software (e.g. turning sound off)	0 1 2 3	NA
44. Allows student control of appropriate aspects of the software	0 1 2 3	NA

Student Response

45. Engages the learner	0 1 2 3	NA
46. Encourages active learning	0 1 2 3	NA
47. Generates positive responses (e.g. shows the software to peers)	0 1 2 3	NA
48. Yields measurable learning	0 1 2 3	NA

A-Chip Re-Programming

If you had the A-Chip units re-programmed,

49. The re-programming process is easy	0 1 2 3	NA
50. The re-programming process is orderly and businesslike	0 1 2 3	NA
51. The re-programming is completed on time	0 1 2 3	NA
52. The re-programming is accurate	0 1 2 3	NA

53. Below is a listing of some of the pre-programmed modules available for the A-Chip unit. Please check the boxes of the modules that you have used with your students. (Check all that apply.)

- ❑ Math Review for Grades 2-4
- ❑ Math Word Problems for Grades 2-4
- ❑ Math Review for Grades 5 and 6
- ❑ Reading Comprehension for Grades 3 and 4
- ❑ Word Exercises and Review for Grades 3-4
- ❑ Reading Comprehension Exercises for Grades 5 and 6
- ❑ Vocabulary Guide
- ❑ Earth Science Introduction
- ❑ Introduction to Space
- ❑ Oceans and Science
- ❑ Plants in Our Biosphere
- ❑ Knowledge Checker
- ❑ The United States Constitution
- ❑ African American Leadership
- ❑ SAT 1 Verbal Review
- ❑ GED Verbal Review
- ❑ Golf Rules, Etiquette and Lingo
- ❑ Fastfood Menus and Nutrition Guide
- ❑ Health and Nutrition Trivia Games
- ❑ Travel Trivia

54. Please complete this sentence: "When my students used the A-Chip unit, they _____

55. What are some good features of the A-Chip unit? _____

56. What are some bad features of the A-Chip unit? _____

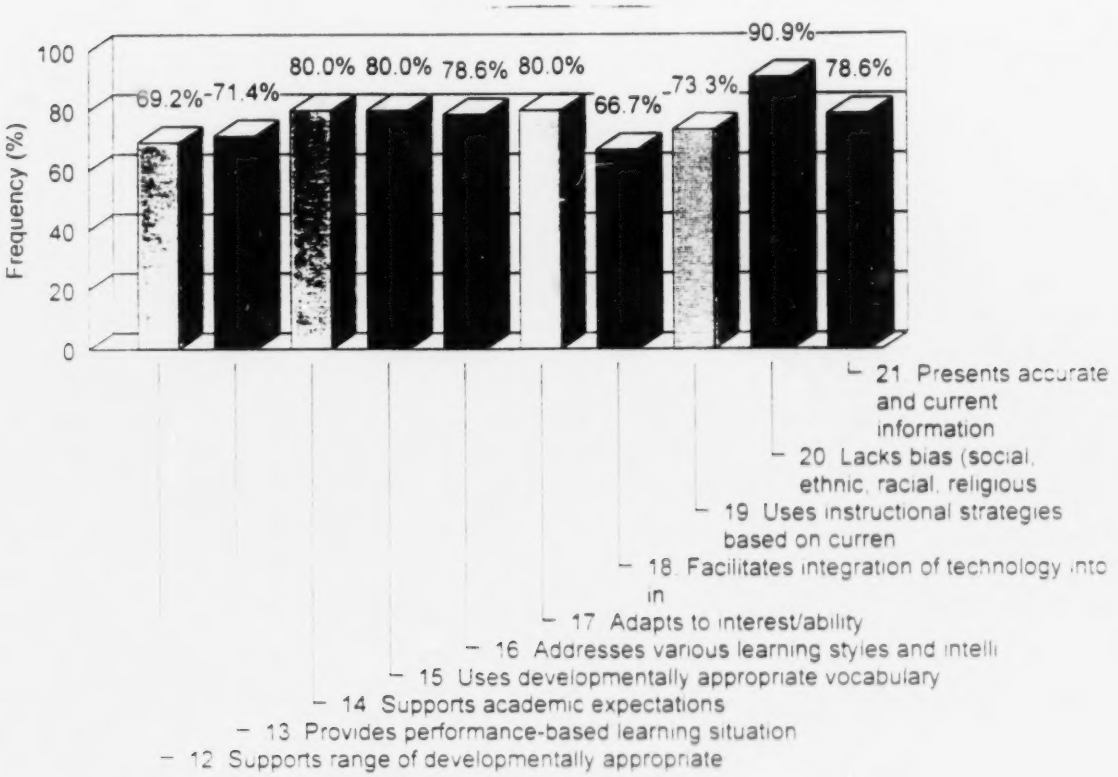
57. Would you recommend the A-Chip unit to other teachers? Yes_____ No_____
Why?

58. Is this the best medium for presenting the material? (Could the material be presented just as well in a book, video or other format?)

Comments and Tips _____

Figure C1

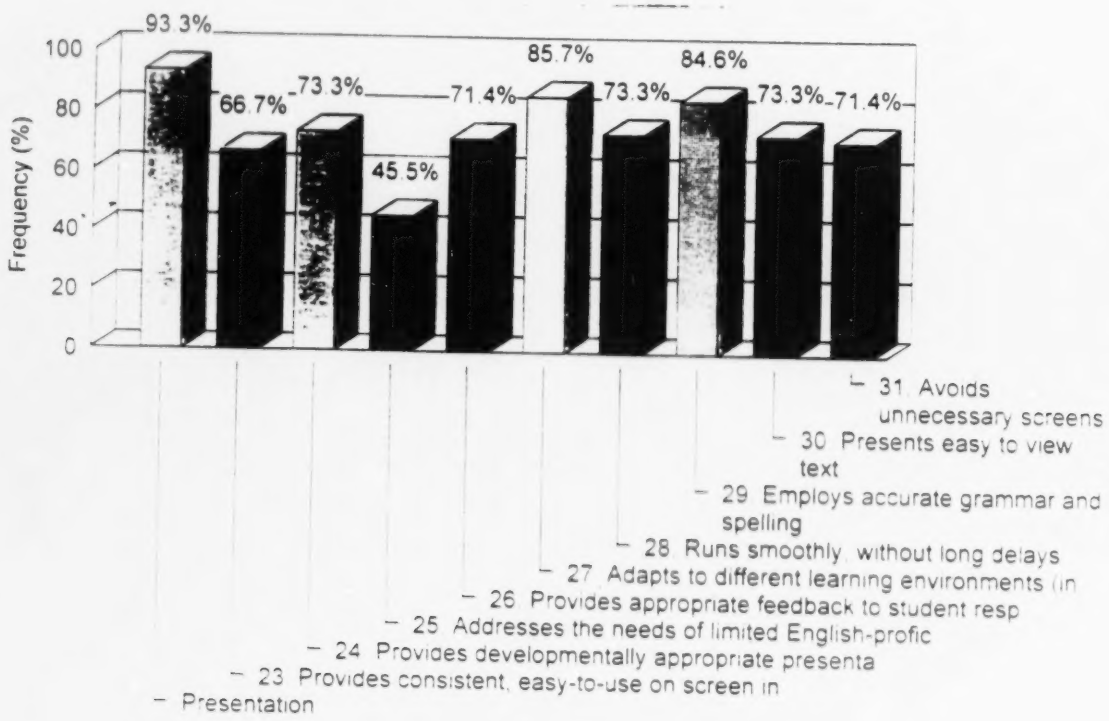
Summary of Teachers Rating Survey Questions Regarding Content a Three



BEST COPY AVAILABLE

Figure C2

Summary of Teachers Rating Survey Questions Regarding Presentation a Three



BEST COPY AVAILABLE

Figure C3

Summary of Teachers Rating Survey Questions Regarding Support a Three

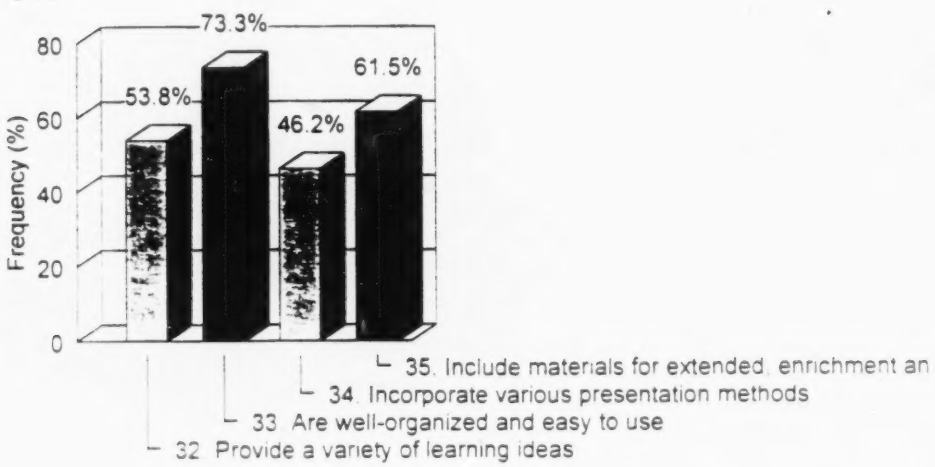


Figure C4

Summary of Teachers Rating Survey Questions Regarding Assessment a Three

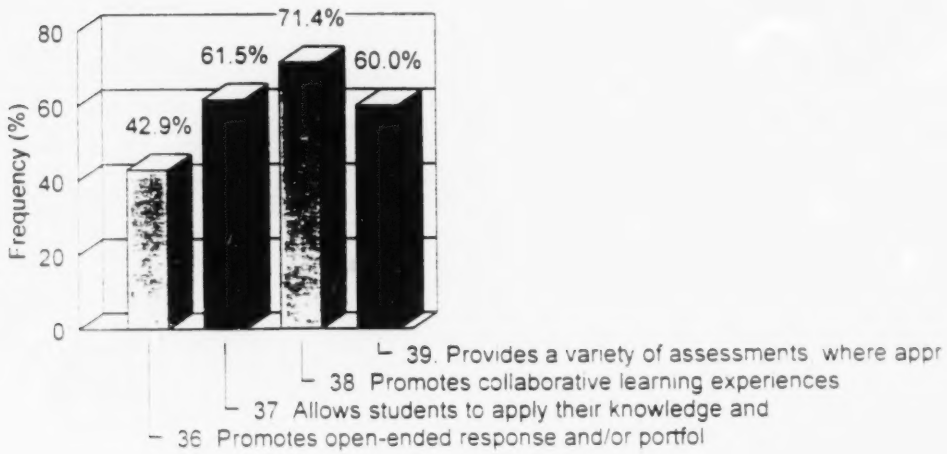


Figure C5

Summary of Teachers Rating Survey Questions Regarding Management a Three

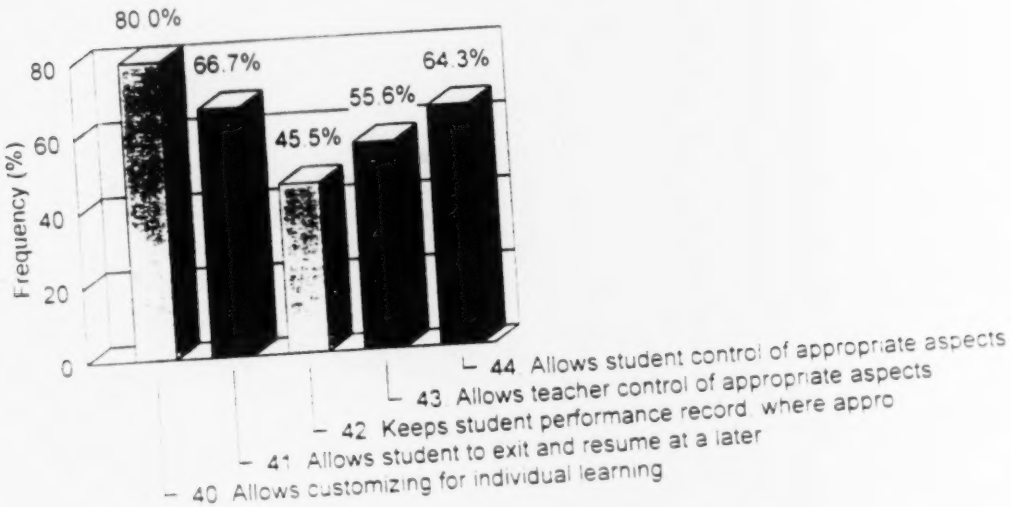


Figure C6

Summary of Teachers Rating Survey Questions Regarding Student Response a Three

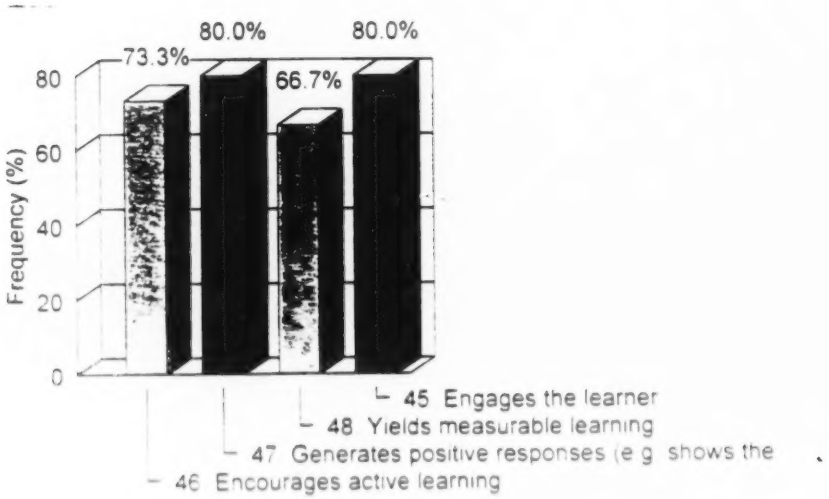
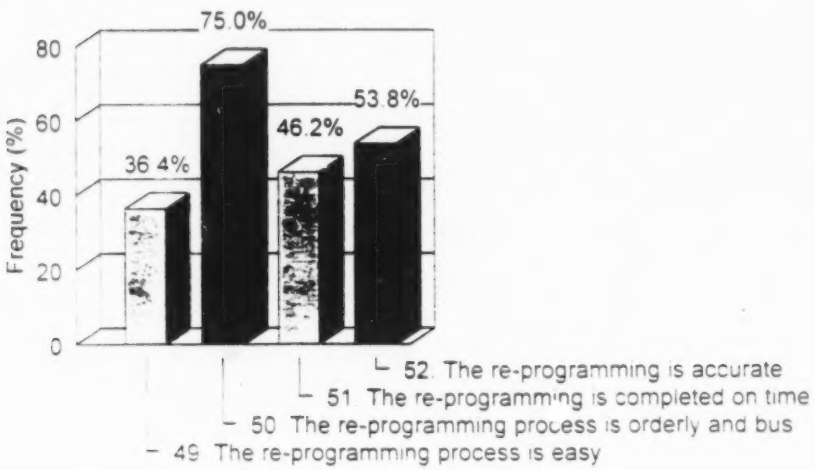


Figure C7

Summary of Teachers Rating Survey Questions Regarding Reprogramming a Three



BEST COPY AVAILABLE

A-CHIP PILOT
TEACHER SURVEY

(1) School Name

37.5%; 6 Webber		12.5%; 2 Finney	
18.8%; 3 Golightly Educational Center		6.2%; 1 Breithaupt	
18.8%; 3 Hannenman		6.2%; 1 Farwell	

Please respond to the following questions regarding your school's participation in the A-Chip Pilot. Your candid opinions regarding the program will assist the district in future planning. Please return all completed surveys to Harvey Czerwinski in the Office of Research, Evaluation and Assessment in the Marie Farrell-Donaldson Building by May 29, 1998. Surveys may also be faxed at 494-2669.

(2) 1. Please identify the grade level that you teach. (Darken all that apply.)

43.8%; 7 8	25.0%; 4 6	12.5%; 2 5	6.2%; 1 12	0.0%; 0 2
37.5%; 6 7	18.8%; 3 10	12.5%; 2 9	0.0%; 0 Kdg	0.0%; 0 Other
25.0%; 4 4	12.5%; 2 3	12.5%; 2 11	0.0%; 0 1	

(3) 2. In what subjects did you use the A-Chip units?

40.0%; 6 Science	20.0%; 3 Language Arts	0.0%; 0 Physical Education
33.3%; 5 Social Studies	13.3%; 2 Other	0.0%; 0 None
26.7%; 4 Mathematics	6.7%; 1 Homeroom	

(4) 3. For what types of learning strategies or purposes did you use the A-Chip units? (Darken all that apply.)

80.0%; 12 Drill & Practice	33.3%; 5 Creativity	6.7%; 1 Management
73.3%; 11 Tutorial	13.3%; 2 Exploratory	0.0%; 0 Utility
46.7%; 7 Critical Thinking	13.3%; 2 Interdisciplinary	0.0%; 0 Other
33.3%; 5 Problem Solving	6.7%; 1 Simulation	

(5) 4. In what setting did you use the A-Chip Units most frequently? (Darken only one.)

40.0%; 6 Large Group/Whole Class	13.3%; 2 Small Group
33.3%; 5 Individual	0.0%; 0 Other
26.7%; 4 Homework	

(6) 5. What percentage of your students used the A-Chip units?

50.0%; 7 More than 75	7.1%; 1 31 to 40	0.0%; 0 11 to 20
28.6%; 4 51 to 75	7.1%; 1 41 to 50	0.0%; 0 21 to 30
7.1%; 1 1 to 10	0.0%; 0 None	

(7) 6. How often did your student's use the A-Chip units?

46.7%; 7 Frequently (2 times a week)
33.3%; 5 Somewhat Often (At least twice a month)
13.3%; 2 Often (At least once a week)
6.7%; 1 Rarely (Maybe once a month)
0.0%; 0 Never

(8) 7. To what extent did you share the A-Chip units with other teachers?

53.8%, 7 Never
15.4%, 2 Somewhat Often (At least twice a month)
15.4%, 2 Rarely (Maybe once a month)
7.7%, 1 Frequently (2 times a week)
7.7%, 1 Often (At least once a week)

(9) 8. Are students using the A-Chip units in more than one class?

33.3%, 5 1 other class | 20.0%, 3 More than three | 13.3%, 2 Not at all
20.0%, 3 2-3 other classes | 13.3%, 2 Don't know

(10) 9. How did your students' use of the A-Chip units positively affect the continuity of instruction in your classroom?

64.3%, 9 A great deal | 35.7%, 5 A little | 0.0%, 0 Not at all

(11) 10. How frequently were your students allowed to take the A-Chip units home?

33.3%, 5 Never
26.7%, 4 Often (At least once a week)
20.0%, 3 Rarely (Maybe once a month)
13.3%, 2 Frequently (2 times a week)
6.7%, 1 Somewhat Often (At least twice a month)

(12) 11. How many times did you have the A-Chip units re-programmed?

33.3%, 5 2 | 20.0%, 3 1 | 13.3%, 2 0 | 13.3%, 2 4 | 20.0%, 3 Other

- 50-100 times
- 8
- 3

Please complete the following checklist to rate the quality of the software programmed on the A-Chip units. Beside each item, please circle the number to indicate your rating of this software, or indicate if that item is not applicable. The lowest rating is 0, the highest rating is 3, and "not applicable" is NA.

Content

(13) 12. Supports range of developmentally appropriate options

0.0%, 0 Rated 0 | 0.0%, 0 Rated 1 | 30.8%, 4 Rated 2 | 69.2%, 9 Rated 3

Mean 2.69 Std Dev 0.48

(14) 13. Provides performance-based learning situations

0.0%, 0 Rated 0 | 0.0%, 0 Rated 1 | 28.6%, 4 Rated 2 | 71.4%, 10 Rated 3

Mean 2.71 Std Dev 0.47

(15) 14. Supports academic expectations

0.0%, 0 Rated 0 | 0.0%, 0 Rated 1 | 20.0%, 3 Rated 2 | 80.0%, 12 Rated 3

Mean 2.80 Std Dev 0.41

BEST COPY AVAILABLE

(16) 15. Uses developmentally appropriate vocabulary

0.0%, 0 Rated 0	0.0%, 0 Rated 1	20.0%, 3 Rated 2	80.0%, 12 Rated 3

Mean 2.80; Std Dev 0.41

(17) 16. Addresses various learning styles and intelligences

0.0%, 0 Rated 0	7.1%, 1 Rated 1	14.3%, 2 Rated 2	78.6%, 11 Rated 3

Mean 2.71; Std Dev 0.61

(18) 17. Adapts to interest/ability

0.0%, 0 Rated 0	0.0%, 0 Rated 1	20.0%, 3 Rated 2	80.0%, 12 Rated 3

Mean 2.80; Std Dev 0.41

(19) 18. Facilitates integration of technology into instruction

0.0%, 0 Rated 0	0.0%, 0 Rated 1	33.3%, 5 Rated 2	66.7%, 10 Rated 3

Mean 2.67; Std Dev 0.49

(20) 19. Uses instructional strategies based on current research

0.0%, 0 Rated 0	0.0%, 0 Rated 1	26.7%, 4 Rated 2	73.3%, 11 Rated 3

Mean 2.73; Std Dev 0.46

(21) 20. Lacks bias (social, ethnic, racial, religious and gender)

0.0%, 0 Rated 0	0.0%, 0 Rated 1	9.1%, 1 Rated 2	90.9%, 10 Rated 3

Mean 2.91; Std Dev 0.30

(22) 21. Presents accurate and current information

0.0%, 0 Rated 0	0.0%, 0 Rated 1	21.4%, 3 Rated 2	78.6%, 11 Rated 3

Mean 2.79; Std Dev 0.43

Presentation

(23) 22. Presents materials in an organized manner

0.0%, 0 Rated 0	0.0%, 0 Rated 1	6.7%, 1 Rated 2	93.3%, 14 Rated 3

Mean 2.93; Std Dev 0.26

(24) 23. Provides consistent, easy-to-use on screen instructions

0.0%, 0 Rated 0	13.3%, 2 Rated 1	20.0%, 3 Rated 2	66.7%, 10 Rated 3

Mean 2.53; Std Dev 0.74

(25) 24. Provides developmentally appropriate presentation format

0.0%; 0 Rated 0	0.0%; 0 Rated 1	26.7%; 4 Rated 2	73.3%; 11 Rated 3

Mean 2.73; Std Dev 0.46

(26) 25. Addresses the needs of limited English-proficiency students

0.0%; 0 Rated 0	27.3%; 3 Rated 1	27.3%; 3 Rated 2	45.5%; 5 Rated 3

Mean 2.18; Std Dev 0.87

(27) 26. Provides appropriate feedback to student response

0.0%; 0 Rated 0	7.1%; 1 Rated 1	21.4%; 3 Rated 2	71.4%; 10 Rated 3

Mean 2.64; Std Dev 0.63

(28) 27. Adapts to different learning environments (individual, small and large group)

7.1%; 1 Rated 0	0.0%; 0 Rated 1	7.1%; 1 Rated 2	85.7%; 12 Rated 3

Mean 2.71; Std Dev 0.83

(29) 28. Runs smoothly, without long delays

0.0%; 0 Rated 0	0.0%; 0 Rated 1	26.7%; 4 Rated 2	73.3%; 11 Rated 3

Mean 2.73; Std Dev 0.46

(30) 29. Employs accurate grammar and spelling

0.0%; 0 Rated 0	0.0%; 0 Rated 1	15.4%; 2 Rated 2	84.6%; 11 Rated 3

Mean 2.85; Std Dev 0.38

(31) 30. Presents easy to view text

0.0%; 0 Rated 0	0.0%; 0 Rated 1	26.7%; 4 Rated 2	73.3%; 11 Rated 3

Mean 2.73; Std Dev 0.46

(32) 31. Avoids unnecessary screens

0.0%; 0 Rated 0	0.0%; 0 Rated 1	28.6%; 4 Rated 2	71.4%; 10 Rated 3

Mean 2.71; Std Dev 0.47

Support

(33) 32. Provide a variety of learning ideas

7.7%; 1 Rated 0	0.0%; 0 Rated 1	38.5%; 5 Rated 2	53.8%; 7 Rated 3

Mean 2.38; Std Dev 0.87

(34) 33. Are well-organized and easy to use

0.0%; 0 Rated 0	0.0%; 0 Rated 1	26.7%; 4 Rated 2	73.3%; 11 Rated 3

Mean 2.73; Std Dev 0.46

(35) 34 Incorporate various presentation methods

0.0%; 0 Rated 0	7.7%; 1 Rated 1	46.2%; 6 Rated 2	46.2%; 6 Rated 3

Mean 2.38; Std Dev 0.65

(36) 35. Include materials for extended, enrichment and remedial activities

7.7%; 1 Rated 0	0.0%; 0 Rated 1	30.8%; 4 Rated 2	61.5%; 8 Rated 3

Mean 2.46; Std Dev 0.88

Assessment

(37) 36 Promotes open-ended response and/or portfolio opportunities

7.1%; 1 Rated 0	14.3%; 2 Rated 1	35.7%; 5 Rated 2	42.9%; 6 Rated 3

Mean 2.14; Std Dev 0.95

(38) 37 Allows students to apply their knowledge and skills in real-life situations

0.0%; 0 Rated 0	7.7%; 1 Rated 1	30.8%; 4 Rated 2	61.5%; 8 Rated 3

Mean 2.54; Std Dev 0.66

(39) 38 Promotes collaborative learning experiences

0.0%; 0 Rated 0	7.1%; 1 Rated 1	21.4%; 3 Rated 2	71.4%; 10 Rated 3

Mean 2.64; Std Dev 0.63

(40) 39 Provides a variety of assessments, where appropriate

0.0%; 0 Rated 0	6.7%; 1 Rated 1	33.3%; 5 Rated 2	60.0%; 9 Rated 3

Mean 2.53; Std Dev 0.64

Management

(41) 40. Allows customizing for individual learning needs

0.0%; 0 Rated 0	0.0%; 0 Rated 1	20.0%; 3 Rated 2	80.0%; 12 Rated 3

Mean 2.80; Std Dev 0.41

(42) 41 Allows student to exit and resume at a later time

13.3%; 2 Rated 0	6.7%; 1 Rated 1	13.3%; 2 Rated 2	66.7%; 10 Rated 3

Mean 2.33; Std Dev 1.11

(43) 42. Keeps student performance record, where appropriate

9.1%,	1	Rated 0	18.2%,	2	Rated 1	27.3%, 3	Rated 2	45.5%, 5	Rated 3

Mean 2.09; Std Dev 1.04

(44) 43. Allows teacher control of appropriate aspects of the software (e.g. turning sound off)

22.2%,	2	Rated 0	0.0%,	0	Rated 1	22.2%, 2	Rated 2	55.6%, 5	Rated 3

Mean 2.11; Std Dev 1.27

(45) 44. Allows student control of appropriate aspects of the software

7.1%,	1	Rated 0	0.0%,	0	Rated 1	28.6%, 4	Rated 2	64.3%, 9	Rated 3

Mean 2.50; Std Dev 0.85

Student Response

(46) 45. Engages the learner

0.0%,	0	Rated 0	0.0%,	0	Rated 1	20.0%, 3	Rated 2	80.0%, 12	Rated 3

Mean 2.80; Std Dev 0.41

(47) 46. Encourages active learning

0.0%,	0	Rated 0	0.0%,	0	Rated 1	26.7%, 4	Rated 2	73.3%, 11	Rated 3

Mean 2.73; Std Dev 0.46

(48) 47. Generates positive responses (e.g. shows the software to peers)

0.0%,	0	Rated 0	0.0%,	0	Rated 1	20.0%, 3	Rated 2	80.0%, 12	Rated 3

Mean 2.80; Std Dev 0.41

(49) 48. Yields measurable learning

0.0%,	0	Rated 0	6.7%,	1	Rated 1	26.7%, 4	Rated 2	66.7%, 10	Rated 3

Mean 2.60; Std Dev 0.63

A-Chip Re-Programming

If you had the A-Chip units re-programmed,

(50) 49. The re-programming process is easy

9.1%,	1	Rated 0	9.1%,	1	Rated 1	45.5%, 5	Rated 2	36.4%, 4	Rated 3

Mean 2.09; Std Dev 0.94

(51) 50. The re-programming process is orderly and businesslike

0.0%; 0 Rated 0	0.0%; 0 Rated 1	25.0%; 3 Rated 2	75.0%; 9 Rated 3

Mean 2.75; Std Dev 0.45

(52) 51. The re-programming is completed on time

7.7%; 1 Rated 0	7.7%; 1 Rated 1	38.5%; 5 Rated 2	46.2%; 6 Rated 3

Mean 2.23; Std Dev 0.93

(53) 52. The re-programming is accurate

0.0%; 0 Rated 0	0.0%; 0 Rated 1	46.2%; 6 Rated 2	53.8%; 7 Rated 3

Mean 2.54; Std Dev 0.52

(54) 53. Below is a listing of some of the pre-programmed modules available for the A-Chip unit. Please check the boxes of the modules that you have used with your students. (Check all that apply.)

44.4%,	4	Earth Science Introduction
33.3%,	3	Introduction to Space
33.3%,	3	Oceans and Science
33.3%,	3	Plants in Our Biosphere
33.3%,	3	SAT 1 Verbal Review
22.2%,	2	Math Review for Grades 5 and 6
22.2%,	2	Reading Comprehension for Grades 3 and 4
22.2%,	2	Word Exercises and Review for Grades 3-4
22.2%,	2	Reading Comprehension Exercises for Grades 5 and 6
22.2%,	2	Vocabulary Guide
22.2%,	2	The United States Constitution
22.2%,	2	African American Leadership
11.1%,	1	Math Review for Grades 2-4
11.1%,	1	Math Word Problems for Grades 2-4
11.1%,	1	Knowledge Checker
11.1%,	1	GED Verbal Review
11.1%,	1	Golf Rules, Etiquette and Lingo
11.1%,	1	Travel Trivia
0.0%,	0	Fastfood Menus and Nutrition Guide
0.0%,	0	Health and Nutrition Trivia Games

Untitled

(55) 54. Please complete this sentence: "When my students used the A-Chip unit, they

- seem eager to learn-highly motivated.
- were excited about having their own hand-held computer. (the newness
- are very eager to use the Achip
- love the exercises.
- become very excited and eager to read.
- enjoyed learning and treated it like a game.
- were engaged in a learner-friendly activity.
- were excited to have a computer.
- Actively engaged!
- are extremely excited and beg to use the Achip everyday.

BEST COPY AVAILABLE

- become excited, enthused and their skills improve.
- were excited and interested. They eagerly helped each other to quickly learn how to use the unit.
- got very excited.
- used it as a skill builder in math.

(56) 55. What are some good features of the A-Chip unit?

- infusion of tech in instruction, the testing capabilities
- compact and user friendly
- It is a hand computer, which makes it user-friendly.
- It lets the students have individualized instruction as well as group work.
- It is small and easy to handle. The buttons remind students fo a video game (game boy).
- small, compact, program is set up like a game, instant feedback
- The units promoted collaborative learning. Students assisted each other in operating the units successfully.
- Feedback on questions
- ease of use, compactness
- Builds self-confidence in the student. Helps students to become competitive
- Immediate feedback and evaluation
- Easy to use-gets students attention-can be easily reprogrammed-can be taken home-gives immediate feedback
- Easy to use. Very few functions
- Mini-computer, easy to manipulate, skills can be reprogrammed.

(57) 56. What are some bad features of the A-Chip unit?

27.3%, 3 none 72.7%, 8 Other

- no way to correct errors
- The programming process requires extra time for teachers to plan an assignment.
- I cannot get enough of it.
- No input-will not total responses and save for evaluation.
- Can't save answers on screens for grading.
- narrowing programming options
- None
- None
- If possible, a larger screen may help to provide more of the directions and more of the story at one time.
- Hard to assess when the students finish because the screen clears too fast.

(58) 57. Would you recommend the A-Chip unit to other teachers? Yes_____ No_____
Why?

28.6%, 4 yes 71.4%, 10 Other

- yes. Provides access to tech to every student-fun way of introducing challenging concepts.
- Yes. The Achip would introduce students to a piece of technology. The teacher can begin to integrate technology and curriculum for a more effective instruction to meet students' needs.
- Yes
- Yes. The Achip takes the boredom out of learning for the students.
- Yes. For some teachers the Achip would be a mild introduction to the use of computers. From there, they can progress to more widespread computer use.
- yes. This is an instructional tool that can be utilized in any content area.
- Yes. It has been proven to be an affective teaching tool for any student. Holding the interest of even the slow learner.
- Yes. The game format allows students to learn without the fear of being wrong.
- Yes. Great idea!

BEST COPY AVAILABLE

- Yes. Because it was an exciting learning expenence for the students.
- Yes. Use to reinforce skills previously taught.

(59) 58. Is this the best medium for presenting the material? (Could the material be presented just as well in a book, video or other format?)

- Not always-the level of motivation for my students increased greatly and so did their scores on weekly tests, when I used the Achip units.
- Yes. It could be presented in another matter.
- The material can be presented in other media, but the Achip is very affective because students are familiar with hand objects. This is another means to use technology for instructions.
- Yes. I like this medium. Although the medium could be presented on video or book format. I like the Achip.
- No, it isn't the best medium for presenting material, but it is a great reinforcement.
- It is a positive way to present material.
- The students enjoyed the small size of the unit.
- may not be the best yet
- Due to our students increasing their knowledge of the technology in various forms, this "chip" makes student learning and evaluations unique.
- In my opinion, there isn't a best way. All of the above mediums compliment each other.
- It has the potential, however, it would be more effective if the material were alreacy programmed in.
- Yes.

(60) Comments and Tips

- Good instructional tool, gooc for tutorial, practice and drill, MEAP preparation drills, etc.
- It would be nice to be able to show Achip on an overhead projector.
- The Achip is very convenient for students to take home. Homework lessons coulc be prepared on the Achip to reinforce previous lessons-students find the Achip fascinating, therefore they are learning what the teacher wants them to know. Oftentimes, assigning homework on worksheets, students do not bring howmework back to class...they will bring the Achip back to class.
- Please improve the re-programming process.
- I need to see current MAT results to really evaluate how effective the Achip was.
- Contact publishers to have access to review questions. Make it possible for teachers to see latest score on Achip screens. Students would save after making 100% correct answers.
- I continuously submitted problems to be entered and chips to be burned-no response. This s a year and one half and nothing. I need to move on to a new resource.
- Keep up the good work! Improve tecnology and continual upgraces.
- This could be used as an enrichment tool or for the slow learner. Any child would find it an asset to any school program. Terrific.
- Using the Achip in conjunction with other resources has allowed most of my students to progress at a faster rate.
- Many more pre-programmed moduales are needed.

BEST COPY AVAILABLE